Interview with CAPT Raymond Watten, MC, USN (Ret.), former Commanding Officer of Naval Medical Research Unit-2 (NAMRU-2). Conducted by Jan K. Herman, Historian of the Navy Medical Department, 3 March 2006.

Where are you from?

Minneapolis, Minnesota. I'm the sixth child of Norwegian immigrants. Both my parents were born in Norway and I have very close connections with a number of cousins there. I've visited them a couple of times. So I'm 100 percent Norsk.

Where did you go to school?

A local grammar school and high school. I had 1 year at the University of Minnesota in 1940. After Pearl Harbor in 1941, I got tired of finding a place to go that might be interesting so I volunteered for a civilian training course in electronics with the Army Signal Corps. They sent me up to Grand Forks, North Dakota in the middle of the winter. To make a long story short, I screwed up and went AWOL to visit my girlfriend in Minneapolis and they kicked me out of the class. That turned out to be the most fortuitous thing that ever happened to me. The Army had just opened a program called ASTP (Army Specialized Training Program). They were taking young, college age men and sending them back to school because they had predicted a shortage of doctors, dentists, engineers, and they also wanted to train language experts.

After getting checked, I was sent to a training camp in California. I went through basic training and was assigned to be a pole lineman. These were the guys who stretch wires on battlefields. But before I got to that, I had some interviews and qualified for this program. They sent me to Salt Lake City where I took some more tests. I wanted to get into medicine. I had always been interested in medicine. But they said there were no vacancies. So they put me in a pre-engineering curriculum and I ended up in physics, drawing, calculus, and all that.

When the medical branch was opening up and anyone interested could take the AMA quiz or aptitude test, I qualified for that. But in the meantime, the ASTP program, which was only a brief window, decided the war was going so well that they didn't need all the specialties they had thought of except doctors and dentists. So they decided to leave that part open and cancel all the other specialties.

Well, there were a thousand people in this program and they all decided to take the AMA test when it was announced. To make a long story short, the thousand was winnowed down to 10 who were qualified for pre-medical work. So I ended up at the University of California in Berkeley. I finished 3 years of pre-med in 1 year and then got sent to medical school at Stanford, where I graduated in '49 because Stanford didn't award the diploma until you finished an internship.

Where did you do that internship?

I did it in the Navy. I was married and my wife was expecting our first child. Internships and residencies paid nothing--board and room and that was it. Occasionally they would give you $50 dollars a month but I needed more than that. So the recruiters came around from the Army and Navy. I had decided I had enough of the Army so I volunteered to go into the Navy and ended up with an internship at Naval Hospital Long Beach, CA. I ended up with an awful lot of responsibility. It was just at the end of the war and all the doctors who had been drafted were getting out in droves. So it was just regular Navy who had decided to make a career of it. We

didn't have too much in the way of supervision for a lot of our rotations but it certainly developed a lot of self-confidence.

I was there at Long Beach in my first year of residency when the Korean War broke out in 1950. In the meanwhile, they were closing the hospital at Long Beach so I transferred down to San Diego. I had just finished my first year of residency in internal medicine when I got orders to go to Naval Hospital Yokosuka, Japan. I was there for 3 years.

After a year and a half, my wife and two kids were able to come over. After that tour, I reapplied for my second year of residency and got it at Oakland. The third year I elected to work with a group that was doing research on kidney diseases and was assigned to an artificial kidney team. The Naval Hospital at Oakland had the first artificial kidney on the West Coast in 1953. I worked with a guy by the name of Paul Doolah, who stayed in the Navy for quite a while. It was called The Metabolic Research Facility and it was under contract with the University of California Medical Center in San Francisco. It had an ONR [Office of Naval Research] grant to work on kidney problems. So I had some very basic physiological training in that area early on and I was always interested in it. From there went to Taipai in '57. They were just opening NAMRU-2.

At NAMRU-2 I met up with CAPT Bob Phillips. He had visited me when I was in Oakland and I thought he was such a charming guy. We got along well together. When I got to Taipai, I was the first medical officer other than Phillips assigned to the unit, which opened that year. His main interest was in cholera. So I got interested in cholera, too. And with my background in metabolic problems and water and electrolyte distortions in kidney failure, I wrote up a protocol on how to best study cholera patients to determine their electrolyte needs, etc.

Phillips had had experience in Egypt at NAMRU-3. The young doctors working with him allowed patients to have liquid by mouth. They were so dehydrated their tongues felt like cotton. Because of vomiting, they didn't get a good, balance study. Phillips wanted to do it again and also to demonstrate his methods for determining the degree of dehydration by using the copper sulfate method they still use in blood banks. You put a drop of blood in it and if it floats, you're anemic. If it sinks, you're okay and they will take your blood. Anyhow, I got interested in that and helped set up one of his cholera studies in '57.

I understand that Dr. Phillips's theory was that you can't really cure cholera but you can manage it to such a degree that the patient will recover if they can remain hydrated and maintain their electrolyte balance.

Antibiotics will shorten the course of the disease. But in the old days when they didn't have antibiotics, the disease would continue until the patient just pooped themselves out and died in severe dehydration. And, of course, they didn't understand the requirements for salt, potassium, bicarbonate, etc. Phillips was a physiologist and I was a clinician. I was more interested in the patient. There had been various studies that added a little here and a little there of what was needed. First someone said they needed potassium and then someone else later talked about bicarbonate and acidosis and so forth. But we put it all together in this study, which was published in the JCI in '59. That was a marvelous experience.

What do you recall about Dr. Phillips as an individual?

I knew him quite well. He was very formal and was always CAPT Phillips in public. But in private, it was Bob and Ray. I knew him and his family quite well. And I knew his problems. And he did have some. As a matter of fact, his wife still upset with me because I sort of painted him as an alcoholic in this book by van Heyningen and Seal [*Cholera: The American*

Scientific Encounter, 1947-1980]. But anyhow, he is a very difficult person to explain because he was very bright and very laconic in his outlook and manner. He didn't talk an awful lot except when he had a few drinks and would loosen up a little bit. He was a guy who had his eye on the prize, and was often in conflict with the R&D command in the Navy because he wanted to go his own way. As a matter of fact, he had to fight for every bit of permission he could get on cholera because people in Washington kept saying, "Nobody in the Navy has died of cholera since 1905 and we're not worried about it." But he explained cholera this way, and I certainly felt the same way: it was a model for all diarrheal diseases and for the treatment of it from infants all the way up to adults. And that the work should be done as a useful and practical thing for the Navy in general. It would bring honor to the Navy if better modes of treatment could be found and carried out. And that's what happened.

So they let him go his own way, even though he was not always popular in the R&D command because he marched to the beat of his own drum. But he did it very carefully. He was never loud or declamatory about it. He just kept pushing politely and in a very gentlemanly way.

Well, he did get the Lasker Award, which was a very rare thing to see in the Navy.

That was a promotion of John Seal, who really pushed for him to get that. I was at that ceremony with his wife.

The first study you worked on with him was trying to determine the electrolyte balance. How did you do that?

By very scrupulously measuring intake and output--every drop that went in and every drop that came out. Blood samples were taken every 2 hours and measured for all the electrolytes we could possibly do under field conditions. We were working in Bangkok and the electricity wasn't very good. We were there for a couple of months and managed to collect a lot of data on 17 patients.

Were these cholera patients?

Yes. All our patients arrived in shock and near death.

And you saved all of them?

Yes, except one, an old lady who died of heart failure before we finished treatment. A couple of them absconded. In other words, they felt good after the initial treatment and then just signed themselves out.

So the treatment you used was what became known as the cholera cocktail.

No. This was the early version which was all intravenous. And that was because the early phase of cholera is vomiting. If you try to get too much stuff down them by mouth they just throw it back up and that complicates the electrolyte picture. We did three studies there in Bangkok in '57,'58, and '59. And it was in '59 that Bob and I had many discussions about what he called the "oral cocktail" and how it might work. I left in '60 and he continued on with his experiment with Craig Wallace. He also worked with Phillips and got to know him quite well. I think he lives in Vienna, VA. He's been retired quite a while. He replaced me at NAMRU-2 when I left in '60. He worked with Phillips and they set up demonstration units that traveled all over Southeast Asia and all the way up to Japan and Korea promoting the intravenous therapy.

But Bob Phillips would often discuss this idea of a oral replacement and finally got around to it in ’61 or ’62 with Craig Wallace in Manila because cholera had pretty well subsided in Bangkok but was flaring up in Manila and causing a lot of trouble. So they set up a demonstration unit there.

After trying it on a few patients, Phillips, who did have a penchant for publicity despite his low level of proclaiming anything for himself . . . He had some good friends who worked for the international press--Far East and China experts. After trying the oral cocktail on several patients, he put out a press release and got in touch with the papers and it made the wire services. I was in Oakland and read in the newspaper that they had this cocktail with the necessary chemicals to cure diarrhea and that they didn’t need all the fancy stuff.

The problem was that Phillips hadn’t finished the study and the study became somewhat of a disaster. The electrolyte mixture they were giving people contained too much sodium. And they gave it to some people who didn’t have good kidney function. The sodium would build up and they would get hypernetremia or an overload of sodium. They would hold on to water and go into heart failure and die. Out of the 20 patients they treated, five or six didn’t make it. The study was designed to be done without any laboratory support except the copper sulfate test to determine the degree of dehydration. To this day, Craig rarely wants to discuss this because he was put in charge of the study and some people feel he should have stopped after the first death or two.

Phillips immediately went into shock, decided he wasn’t going to do this anymore, and stopped the whole oral rehydration thing. It was then picked up by the guys who were working in East Pakistan (Bangladesh). Even though he locked up his notes and all the data that they had accumulated, they decided to go ahead and use it anyhow, sort of behind his back. So they made up a solution that had less sodium in it--a little different balance of electrolytes--and used it during an epidemic. And it really turned the tide. That’s the moment oral rehydration became acceptable.

How did they ever overcome the issue with the initial vomiting?

It was supposed to have been done initially by rehydrating them intravenously first and getting the acidosis back in balance. The thing that Phillips added to it in the ’60s was sugar. This evidently revitalized what they called the “sodium pump” in the intestine, and helped it to reabsorb a lot of the liquids and materials that would otherwise have been lost in the diarrhea. They could start out with a tentative approach using just liquids by mouth at first. If that didn’t work, they had to be put on IVS. But it worked on enough of them. Now they were getting cholera patients early because of the publicity so they weren’t severely dehydrated. So the oral therapy got them over that initial hump and the vomiting was avoided with most of the patients.

Did Dr. Phillips get back into the program again?

Not really. He actually retired from the SEATO [Southeast Asia Treaty Organization] lab where he was in Dacca, Bangladesh, and was living in Taiwan when most of this was taking place. He washed his hands of the whole thing. And to this day, a lot of people don’t know that he was the father of it. He’s the one who really got it started because the NIH and the Public Health Service people in Bangladesh were willing to take all the credit, of course. And that’s how it happened.

Presumably, when you do the oral cocktail, you have to have a pure water supply.

Yes. It has to be fairly pure. You can't use well water that's contaminated, that's for sure. They used distilled water. Otherwise, you just need to boil the water and that will kill all the bacteria. So the water wasn't too much of a problem. It was a matter of the electrolyte balance--whether they were going to overwhelm the system or the system could handle it.

Where did you go after that?

Vietnam intervened and I spent a lot of time in the late '60s working on interesting projects in Taiwan. There was an epidemic of measles on the island and I got involved in that. A lot of children were getting it. A prospective study was done to determine if the measles virus had anything to do with birth defects in pregnant women. We also did a lot of work with parasitology including oriental lung flukes and schistosomiasis. I was kept very busy there.

The NAMRU-2 headquarters was there in Taipai and in '67, when we were pretty heavily involved in Vietnam you set up a detachment at NSA Danang.

I went back to the States in '60 I was assigned to this metabolic research facility--the artificial kidney outfit and worked there for 5 years and eventually became the director. I was trying to get some interest in clinical research among the various departments and got funding from ONR and the Bureau. I kept my interest in it and kept track of what was going on in cholera. I had a couple of visits back to Taiwan and finished some manuscripts and spent some time with Bob Phillips before he retired.

In '65 Phillips was going to retire and they were looking for a replacement. I was picked to replace him so I went back that year as the CO. I got things revitalized in terms of cholera research and led a couple of teams down to the Philippines working with cholera in children. It's an entirely different ball game when you're taking about 1-, 2-, and 3-year-old kids. They have completely different electrolyte requirements and we did some field studies on that.

I was in Taiwan from '65 to '74--a 9-year tour. I almost beat Phillips, who was there for 10 years. They finally told me I had been there long enough so they sent me to San Diego and given some "keep-busy" jobs and finally set up an obesity clinic using the modified low carbohydrate diet. We did some work on that in the metabolic research unit in Oakland. We used a diet devised by a Dr. Pennington to treat kids with epilepsy. We modified it so it was a thousand-calorie high fat, low carbohydrate diet. We had great luck with it.

After I had been there for a couple of years, there was an opening at NAMRU-5 in Addis Ababa. Craig Wallace had been there as the commanding officer and was retiring so I replaced him but was only there about 6 or 7 months before we were kicked out by the Marxist government. By a fortuitous series of events, I ended up at NAMRU-3 in Cairo as the CO. I was there for 5 years and got involved in a number of interesting problems, including schistosomiasis and Rift Valley Fever. We again came into conflict with the Army because they thought that was their disease because they were working on it at Fort Detrick.

During most of my military life I kept a log book of my travels. It was just a bare bones--take off, landed, where did I go, what did I see, and just brief notes on various things. I have three or four volumes of those things that I can check on. Anyway, I've used those to keep track of things.

I want to take you back for a moment to the Vietnam era. I was looking through the files the other day and discovered some projects the detachment was up to. There was a LT Myron Tong there. Does that name ring a bell?

Yes. He was the first permanently assigned head of the detachment. We got the detachment established January of '67. I've got the names of all the people who were there at the time. Several months later, Myron Tong was sent there to be the first permanent head of the detachment. Prior to that, we had rotated medical personnel from NAMRU-2 down for 1 or 2 months at a time. That didn't work out too well, so I finally convinced the Bureau that they had to give me a couple of bodies to take up some slack and get a little continuity in the place. That's detailed in about six pages that I just pulled out of my memoirs entitled, "Research in a War Zone." I'll send that to you because it contains all the names of the people who were there.

I'd love to talk to some of them, if I could. The NSA hospital there was quite a gathering place for combat casualties. Was the detachment involved in doing the investigations on shock? NSA also had an artificial lung that was being used to treat what was called "Danang Lung." What was that all about?

That was an offshoot of the frozen blood program. That program went along pretty well and they had a lot of people there with technical expertise, including Jerry Moss. This was peripheral to what I was doing because I wasn't involved in it very much. The people who they were resuscitating from these horrible wounds would end up with wet lung, go into shock, collapse, and die. They were trying to develop some means of preventing this pulmonary edema. You'd have to talk to those people on the surgical side to get more information on that. Except for providing some laboratory backup, we didn't get involved in the clinical applications in our small lab.

I know there was a lot of malaria there.

We weren't involved too much with malaria because the Army really considered that to be their bailiwick. But we were tied into serological studies of some of the diseases that young doctors who had trained in the States knew nothing about--fevers of unknown origin. People came in with these fevers and they didn't know what they were. We could provide the laboratory support in serology and so forth and provide an answer. Japanese B Encephalitis was present there as well as leishmaniasis, which is a bug-borne disease that occurs in Southeast Asia. It's not very common. Leptospirosis was ubiquitous. It was an organism present in contaminated water. That caused a lot of trouble and could be fatal at times. Of course there were plenty of diarrheal diseases that we knew quite a bit about and were able to help with.

Different types of dysentery?

Yes. And there was a lot of amebiasis. These grunts were out there in rice paddies, which were fertilized with human waste, and all kinds of parasites would pop up. They had dirty hands and just couldn't keep themselves clean too easily.

Your main headquarters was in Taipai and then you'd go to Danang to do these inspections.

I would go every couple of months and spend a day or two or a week or two. I was in close contact with the situation.

I understand that the detachment would take samples and send them back to Taipai on a weekly basis.

That's right. We had a weekly flight arranged through the Air Force in Okinawa. If we put in a request, they would stop off in Taipai on their way to Danang. It was a problem because we didn't always get very direct flights. I remember once it took me 3 days to get from Taipai to Danang. I ended up in Manila and Saigon. It just took a long time to get there.

How did you enjoy your experience at NAMRU-3?

I enjoyed it. It was wonderful. There was good cooperation with the local health people. It was an enjoyable place to be. My wife got interested in pharaonic history and became the unofficial tour guide for all the visitors we had coming through. When Rift Valley Fever broke out, it kept us pretty busy and we made very close ties with the Ministry of Health. I was appointed to an ad hoc committee on Rift Valley Fever. It was the first time any foreigner participated in one of those. And the Minister of Health arranged for me to get a citation from the government for that.

How did you handle the Rift Valley Fever?

We did mostly epidemiological and serological studies of the disease itself. It was self-limited--a flu-like disease. There were some fatal complications but the were pretty rare. There's no treatment for it once you get it. It just burns itself out. It's a lot like Dengue in that respect. But the important thing was mosquito control.

Where did you go after NAMRU-3?

I retired in '82 and went to Panama as the director of the Gorgas Memorial Laboratory. It was the unhappiest assignment in my professional life. The lab was in danger of collapsing from funding and personnel problems. I'm writing that part of my history right now. I still have a heavy burden of anger about the place. I was terminated from that job.

Was the lab run by the Army?

No. It was an independent, not-for-profit organization based in Washington--the Gorgas Memorial Institute. It's since transferred most of its activities to the University of Alabama. It wasn't the Navy. There was no respect for the chain of command. Most of the people who worked there were very antagonistic toward the military. They were mostly Public Health Service people and other civilians who just didn't like a military organization and a military person running the place. I had very poor cooperation and a lot of problems.

When did you leave there?

In '87. That's when I retired completely from medicine and came here to California initially to grow grapes in the Napa Valley.

Really? You were going to have a winery?

Yes. I was going to grow grapes and make my own wine but I found out that making wine is not as easy as it sounds. I never really got into it but I really enjoy wine. Kenwood is right in the middle of the Sonoma Valley. Within 5 miles of our house there must be a dozen wineries and I know a lot of people in the business. I got interested instead in writing my memoirs, gardening, and making sausages.

So, you're really enjoying your retirement, then.

Oh, yes. I travel a good bit. I've been to mainland China three times. My wife has relatives in Canada. Her daughter is in Seattle. Most of my children live in the Bay area. It's been a great retirement.

Well, it's certainly been a delight talking with you this afternoon.

If you have any notes you want to send me to look at, please send them to me and I'd be delighted to do so.

I was particularly interested in the Vietnam era and doing a lot of interviewing of our personnel from back then. I'd really be interested in contacting any of the folks who may have been assigned to the detachment at NSA.

I'll be happy to send you some names that I have.

That will be great.

When I went back in '65, I took an orientation tour. That was my first trip to Danang and that was my first introduction to establishing a unit there. If you want any more on cholera and any of the related research, let me know.

I've been very interested in the cholera program over the years and Dr. Phillips' and your participation is very worthy of further study. Any information on that would be very useful to me.

I'll send you whatever you want.

Thank you for everything.

You're very welcome.

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